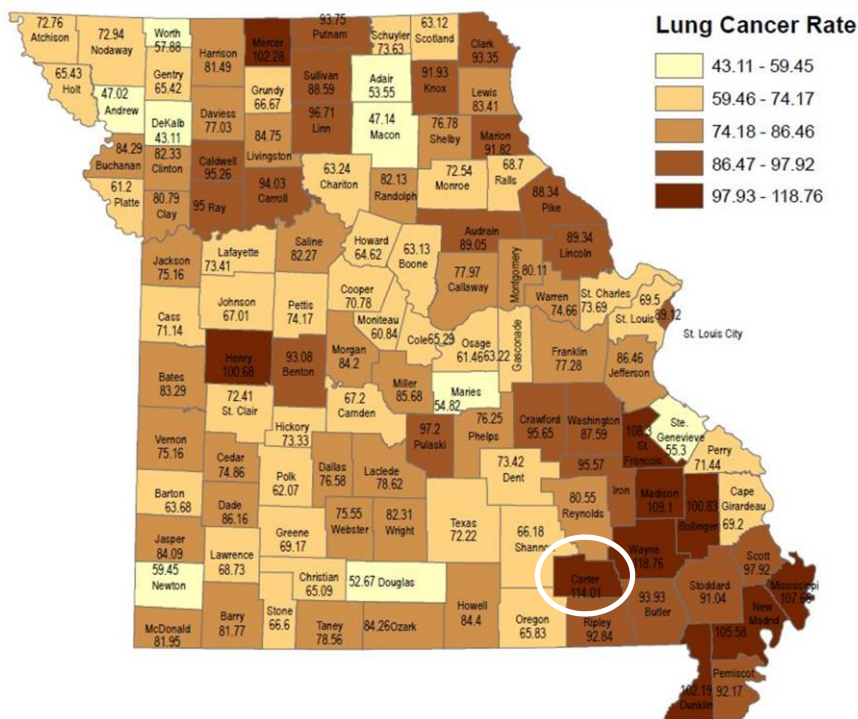




Problem

Radon is a naturally occurring radioactive gas that is colorless, odorless, and tasteless.¹ It comes from the natural breakdown of uranium in soil and moves up through the ground to the air and enters buildings through cracks and gaps in the floors, walls and windows. It can also be in ground water, released into the air when showering and inhaled. These particles enter the lungs and initiate a carcinogenic process. Radon is a leading cause of lung cancer in the nation, second only to smoking.² However, cigarette smoking in addition to radon exposure greatly increases the risk of lung cancer.

Figure 1. Lung/bronchus Cancer Age-adjusted Incidence Rates, Missouri, 2008-2013



In Missouri, Carter County had the second highest rate of new lung/bronchus cancer (114.0, 95% CI 86.4-147.7 per 100,000) among counties in Missouri (Figure 1) and was significantly higher than the state (76.1, 95% CI 75.3-77.0) and US (63.5, 95% CI 63.4-63.6) rates for 2008-2013.³ Carter County also had the second highest rate of deaths from lung/bronchus/trachea cancer (93.7 (95% CI 68.6-125.0) among the counties and was significantly higher than the state (56.4, 95% CI 55.7-57.1) and US (46.6 95% CI 46.6-46.7) rates for the same time period. In 2011, more than one-fourth (27.1%) of adults in Carter County were current cigarette smokers which also contributed to the high incidence and mortality rates from lung cancer.⁴ The purpose of this pilot project was to raise the awareness of the primary risk factors for lung cancer (i.e., smoking and radon exposure) and increase home testing in Carter County.

How was Tracking Involved?

The Missouri Environmental Public Health Tracking program provides community data on health and the environment to produce county and city profiles.⁵ These profiles produce useful statistics and public health information for planning and assessing health impacts including tracking the percent of housing units tested and percent of tested housing units that are elevated for radon. The tracking staff joined the collaborative team working to improve the awareness and testing of radon in Carter County. The staff participated in a review of the planning and findings data. Staff also participated in developing the follow-up mitigation letter and questions for residents of homes with elevated radon levels to determine if and what actions were taken to mitigate the elevated radon concentration.

What action was taken to resolve the problem?

Testing is the only way to measure the radon level in a home. Radon concentration is measured in picocuries per liter (pCi/L) of air. As radon concentration increases in a home, the risk to health also increases. The average radon level in Carter County is 4.2 pCi/L, which is similar to the average state level of 4.3 pCi/L.⁶ The Environmental Protection Agency (EPA) recommends installing a mitigation system in homes when the radon concentration is 4 pCi/L or greater to lower the health risk. The Comprehensive Cancer Control Program (CCCP) and the Radon Program collaborated with the Carter County Health Department (CCHD) to address local concerns of elevated rates of lung cancer incidence and mortality compared to the state rates by holding a public meeting and distributing radon test kits in the community. The collaboration resulted in a town hall meeting hosted by the CCHD on November 3, 2016 in Van Buren, Missouri. The town hall was open to the public and attended by the CCCP manager and Radon Program staff. Prior to the meeting, the Radon Program mailed 50 radon test kits to the CCHD to distribute to staff and the public. Information on lung cancer incidence and mortality in the county was also provided along with information on the link between radon and lung cancer through a public announcement titled “Is Your Home Safe?”

How would you quantify the impact of the resulting action on the health of the population?

Approximately 25 community members attended, and 21 test kits were distributed at the town hall meeting. Prior to this pilot project, 17 homes and two schools had been tested for radon. Of the 17 homes, six (35.3%) had elevated concentrations of radon. The two schools did not show elevated results. Overall, the Carter County test results from a sample of 61 homes (44 distributed from 2016-2017 and 17 earlier tests) indicated that 41% were at 4.0 pCi/L or higher with a range of 0.15 pCi/L to 30.5 pCi/L. The collaboration and pilot project increased awareness and radon testing in the community with more than a 250% increase in testing. To ascertain whether further action was initiated, a letter was sent to the homes with elevated radon levels that asked if mitigation had been completed. Ten responses were received with one completing their own mitigation, five (50%) could not due to cost, two planned to repeat the test, and two had not for other reasons. As of February 2018, 14 additional homes have been tested in Carter County. This pilot demonstrates that the awareness for radon testing can be increased through community forums combined with supplying free radon test kits and providing risk information. However, if the test is elevated, additional resources are needed for residents to take steps to mitigate long-term exposure.

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